CAPSTONE PROJECT

PROJECT TITLE

Presented By:
1. Raj Mohamed – Anjalai Ammal Mahalingam Engineering College – Computer Science and Engineering

edunet foundation

OUTLINE

- Problem Statement
- Proposed System/Solution
- System Development Approach
- Model & Deployment
- Result (Output Image)
- Conclusion
- Future Scope
- References

PROBLEM STATEMENT

- To develop an Agentic AI Health Symptom Checker that helps users understand their health conditions by analyzing symptoms and providing probable causes, preventive advice, and care recommendations. It retrieves verified medical data, symptom databases, and guidelines from trusted sources like WHO, government health portals, and medical journals.
- The agent delivers reliable information by strictly grounding its responses in factual data and clearly stated assumptions. It avoids speculation or self-prediction, instead relying on thorough analysis from multiple trusted sources to ensure accuracy. This approach minimizes misinformation and prevents unwarranted diagnoses or conclusions.

PROPOSED SOLUTION

- The system aims to predict potential health issues based on user symptoms using advanced AI reasoning. It combines IBM Granite-3-3-8b, ReAct , LangGraph with real-time web search tools like Google, DuckDuckGo, and Wikipedia for accurate, up-to-date results.
- Defining the goal:
  - Defining the goal of the ai agent , by providing the instruction to the agent.
  - Define the outcome , sensitivity and reliability of the agent.
- Models and tools:
  - Select the appropriate model for the agent to understand and interact with user in natural language.
  - Select the required tools to search informations from trusted resources and region based output.
- AI Reasoning System :
  - ReAct is used as the reasoning engine of the agent which is responsible for reasoning and agent actions
  - LangGraph is used to control the flow of the agent by managing the memory and state of the agent
- Deployment:
  - The agent is deployed in the IBM cloud environment and can be accessed using the endpoint URL
  - Build a simple web interface for symptoms input and AI output using the IBM agent AI
  - Ensure fast response and scalable backend.
- Evaluation:
  - Measure accuracy, speed, and user satisfaction.
  - Continuously improve based on user feedback and updated data.

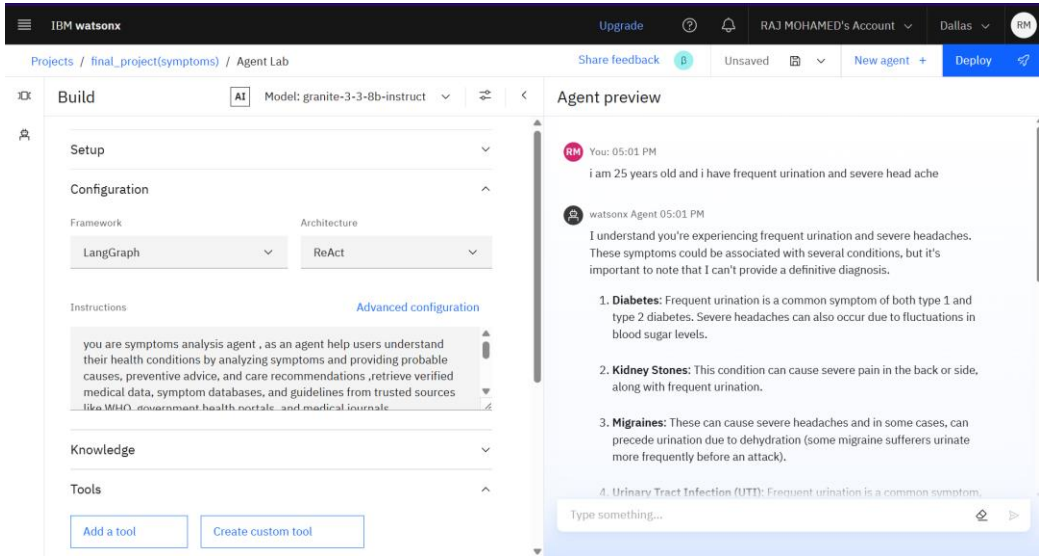
SYSTEM APPROACH

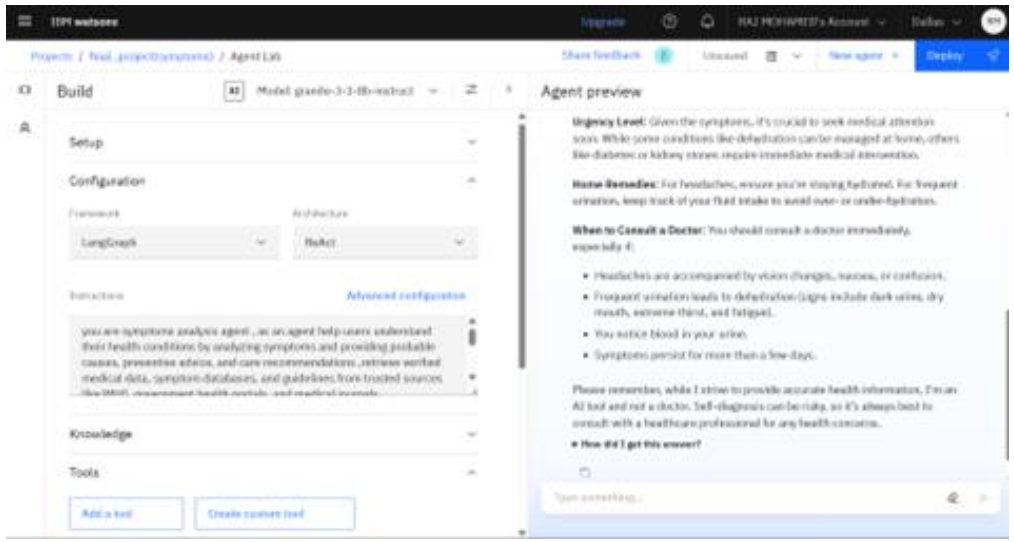
- This project uses IBM Granite-3-3-8b to process natural language and analyze user symptoms and suggest possible health issues through real-time AI reasoning and web search integration and uses LangGraph to provide results.
- System requirements
  - CPU & 4Gb Ram as virtual resources
  - Watson.ai studio and Watson.ai runtime environment for development
  - IBM granite model for natural language processing
  - ReAct and langGraph models for control flow and reasoning of agent
  - IBM cloud services for deployment
- Library required to build the model
  - Transformers , torch ,accelerate , torchvision for model handling
  - LangChain or haystack for agentic logic
  - GoogleSearch – python , Wikipedia for information retrieval
  - Flask, request for API and scraping
  - Pandas , numpy for data handling

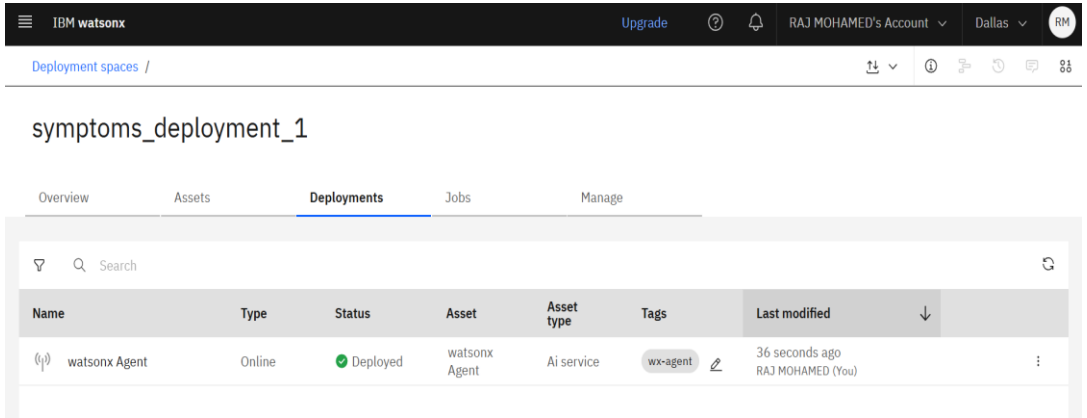
MODEL & DEPLOYMENT

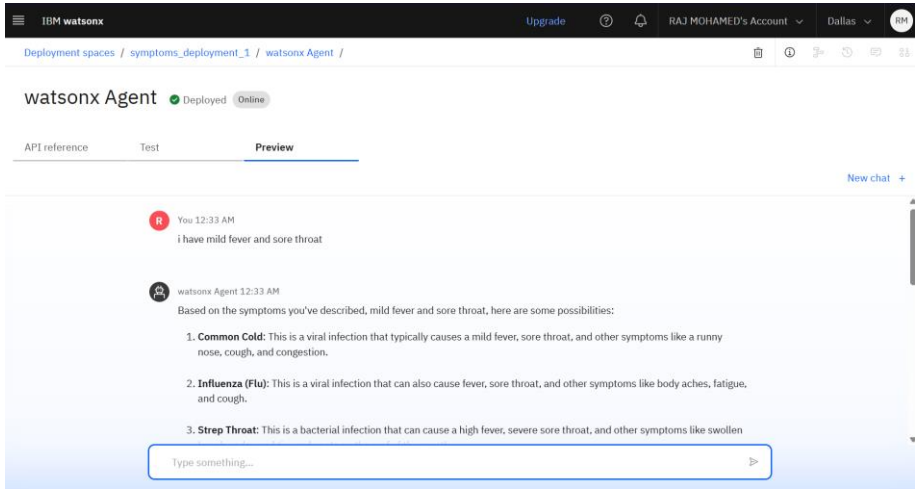
- **Model Selection:**
  - The system uses **IBM Granite-3-3-8b**, a large language model specialized in **natural language processing (NLP)**. It's selected for its strong contextual understanding, reasoning abilities, and capacity to process complex symptom descriptions in conversational form.
- **Data Input:**
  - Inputs include natural language - symptom descriptions from users such as "I've sore throat and running nose for past 2 days ". The user prompts the symptoms in the natural language and follow up questions .
- **Instructing the role of agent:**
  - By clearly defining the agent's role and enabling it to process data effectively, it can analyze user-reported symptoms to deliver more accurate results. This promotes early detection, minimizes misinformation, and empowers users to make informed health decisions.
- **Prediction Process:**
  - The model processes input symptoms, queries external sources from google , Wikipedia , web scraping in real time, and generates likely condition suggestions with supporting explanations. Its predictions adapt dynamically based on the live information retrieved during the session.
- **Deployment :**
  - The agent has been thoroughly tested and successfully deployed in the IBM Cloud environment using the Watson.ai runtime service.
  - It is globally accessible via a dedicated endpoint URL and can be seamlessly integrated into other projects and platforms.

RESULT









edunet foundation

CONCLUSION

- The agentic AI system proved effective in processing diverse health-related inputs, maintaining secure data handling, and delivering accurate, multilingual guidance. Its design aligns with ethical and educational principles, reinforcing trust in digital health interactions. In medical fields, this agent can assist in preliminary symptom assessment, support telemedicine workflows, and aid underserved communities with language-specific health literacy tools. Its consistency, transparency, and adaptability establish it as a valuable enhancement to modern healthcare systems, especially in early-stage patient engagement and information access.

FUTURE SCOPE

- Incorporate adaptive learning models that evolve based on user feedback and interactions to improve symptom detection accuracy.
- **Expand the medical database by including up-to-date clinical guidelines, regional health trends, and localized disease patterns to boost reliability and relevance**
- **Strengthen multilingual support and cultural adaptability to ensure broader inclusivity and reach.**
- **Integrate advanced personalization features, such as tracking user health history and preferences, to deliver tailored and meaningful healthcare responses.**
- **Promote interoperability with other healthcare systems and APIs, allowing the symptom checker to serve as a modular component within broader health tech ecosystems.**

REFERENCES

- Agentic AI Architecture – IBM
  Explains how agentic systems autonomously plan and execute tasks using LLMs, orchestration, and tool integration.
- Granite Product Guide – IBM
  Details IBM's suite of enterprise-grade generative AI models, including language, code, and time-series variants.
- Watsonx.ai Product Page – IBM
  Describes the AI studio for building, training, and deploying foundation models.
- Isabel Symptom Checker
  A professional-grade tool used by hospitals for accurate symptom analysis.
- Agentic AI Health Symptom Checker – GitHub Project
  A working example using IBM Watsonx.ai and Granite models to analyze symptoms and provide guidance.

IBM CERTIFICATIONS

In recognition of the commitment to achieve professional excellence

Getting Started with Artificial Intelligence
IBM SkillsBuild

RAJ MOHAMED

Has successfully satisfied the requirements for:

Getting Started with Artificial Intelligence

Issued on: Jul 17, 2025
Issued by: IBM SkillsBuild

Verify: https://www.credly.com/badges/d2a9dc72-0a37-430c-ad03-3e9af19a08eb

IBM

IBM CERTIFICATIONS

In recognition of the commitment to achieve professional excellence

Journey to Cloud: Envisioning Your Solution
IBM SkillsBuild

RAJ MOHAMED

Has successfully satisfied the requirements for:

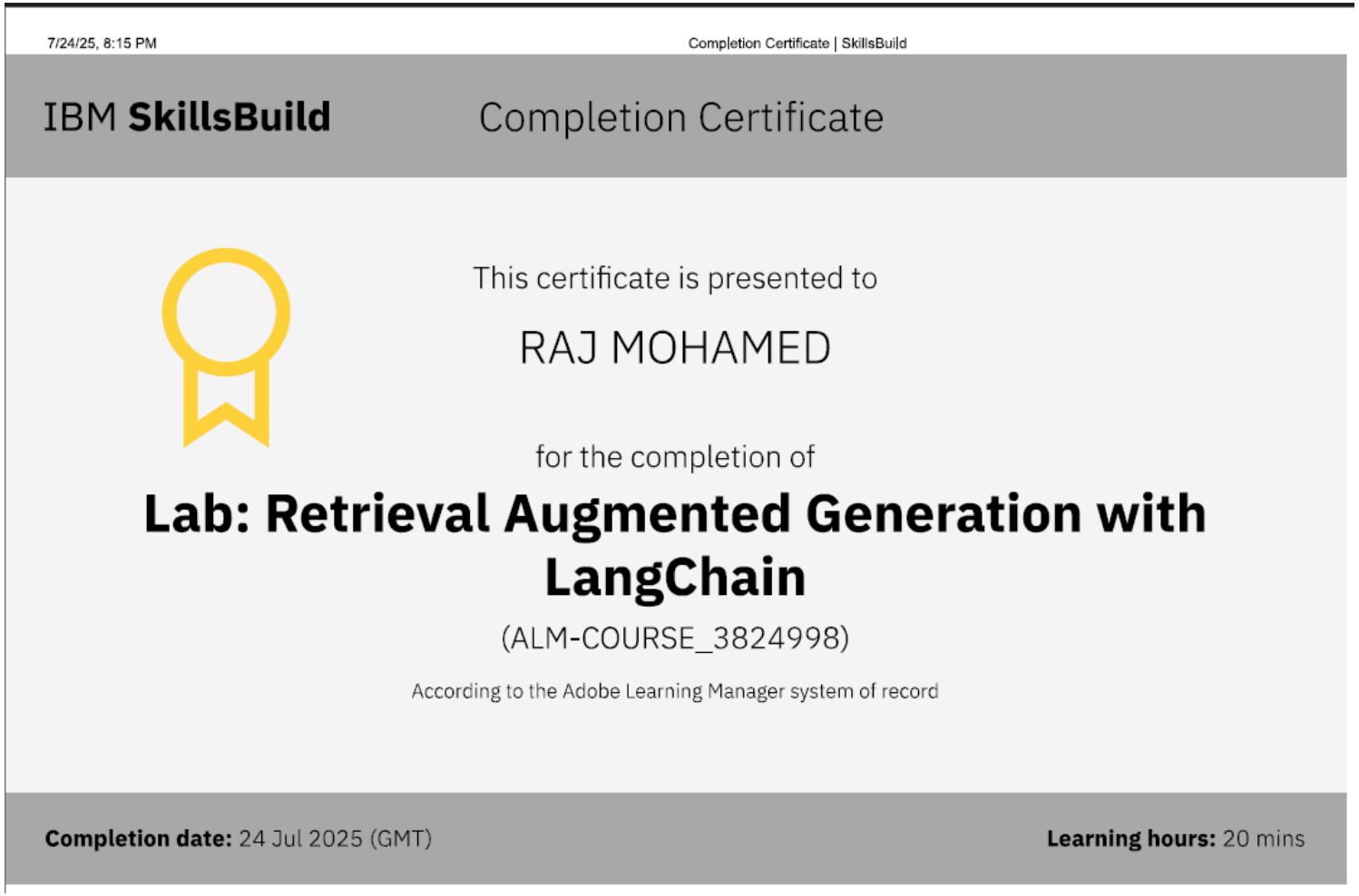
Journey to Cloud: Envisioning Your Solution

Issued on: Jul 18, 2025
Issued by: IBM SkillsBuild

Verify: https://www.credly.com/badges/f30d40c8-a81c-442e-bb37-d5cd27bb0957

IBM

IBM CERTIFICATIONS



7/24/25, 8:15 PM Completion Certificate | SkillsBuild

IBM **SkillsBuild** Completion Certificate

This certificate is presented to

RAJ MOHAMED

for the completion of

Lab: Retrieval Augmented Generation with LangChain

(ALM-COURSE_3824998)

According to the Adobe Learning Manager system of record

Completion date: 24 Jul 2025 (GMT) **Learning hours:** 20 mins

THANK YOU

edunet foundation